Topographical Patterns of Keratoconus in Iraq

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Abstract

Purpose: The purpose of our study is to view the curve-distribution of variable topographical patterns among Iraqi people and to compare the data with other Asian results.

Methods: This "cross sectional" study included patients all of them presented to Al_Diwanyia Teaching Hospital in Iraq, asking for visual correction. Period of data collection from May 2018 to September 2019.All participating subjects were diagnosed with the disease in both eyes and did not do any surgery for their keratoconus at the time of study- data collection.

Results: This study includes 94 eyes of47 patient from Al_Diwanyia city; all examined by pentacamtopographic system diagnosed with keratoconus bilaterally, the most common pattern was asymmetric bowtie with angulation followed by asymmetric bowtie inferior steep then the round and irregular shapes respectively.

Conclusion: Asymmetric Bowtie with angulation (A.B. with angulation) was the most Common topographic type, followed by Asymmetric Bowtie Inferior steep(A.B.I.S.), Round and Irregular The patterns are similar to that of other Asian people.

KEYWORDS: Cornea, keratoconus, astigmatism

Importance of the study:

Keratoconus is a common eye problem in Iraq, studying the pattern of this disorder is of importance in diagnosis, fellow up and deciding the treatment pattern for each form. We consider the publication of our manuscript in your decent journal due to its international reputation and scientific editing process, all authors participate in data collection and analysis and in the final discussion, all author declare no conflict of interest in the study and there is no funding agency, its self-funded study.

Introduction

Keratoconus is an innovative decrease in thickness and increase curvature of the cornea that begin at adulthood, the degree of astigmatism increases with the increments of corneal steepening causing a disruption of the picture which decrease visible acuity of affected eyes [1]. Diagnosis of keratoconus is a genuine method would relies upon on definitive specific symptoms similarly to corneal topographical changes. In the final time, optical imaging gadgets including (Pentacam) and /or (Orbscan) have made it feasible for doctors to acquire lots of data approximately the anterior segment[2]. Keratoconus is a complex country with avariable pathophysiological etiology concerning each external factors which includes vernal keratocojunctivitis allergy, persistent rubbing of the eyes, and genetics elements[3]–[5]. Severity of the condition related to family records and ethnic foundation of the patient. [6][8]. In our area, related peoples marriages are the important motive to an increase incidence rate of Keratoconus [9]. Various ocular and surgical modalities for Keratoconus remedy are available, despite the fact that earlymanagement options are depend on increasing visual acuity,new alternatives aim at prevent the increase of the disorder [10].

Fig.1-1 Common topographical patterns of Keratoconus.
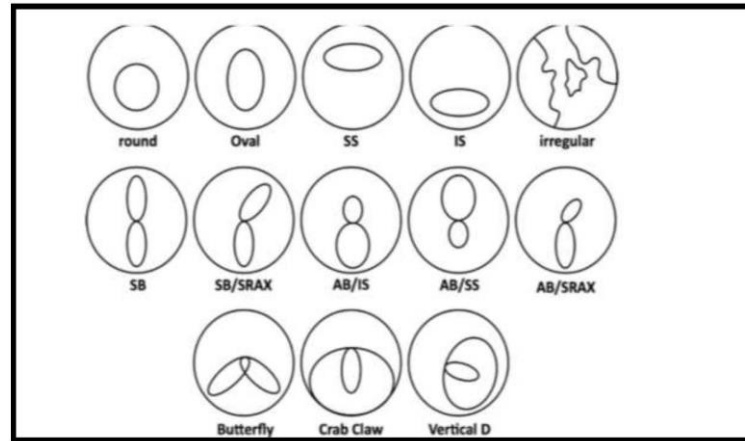
Patients and Methods

This "cross sectional" study included patients all of them presented to Al_Diwaniya Teaching Hospital in Iraq, asking for visual correction. Period of data collection from May 2018 to September 2019.Regarding patients they had keratoconus in both eyes and they have not any surgery before for their disease at the time of study data collect. These patient were examined by slit lamp to detect any signs of keratoconus, like vogt-stria, Manson's signs and opacity of acute hydrops. Then for visual acuity to see the best corrected vision and retinoscopy to elicit scissoring reflex which support our diagnosis of keratoconus. Fundus examination done for all to elicit any peripheral retinal degenerations. The topography was done for all patients by Pentacam system which is the least affected by tear film disturbance in contrary to the placido disk systems. All the patients were advised to stop contact lenses (soft or hard) for at least 2 weeks before examination and topography. Misalignment was avoided by asking the patient to look to the fixation point.

Testing the corneal topography images was made using the pentacam system camera. The test was done with good or at least moderate quality specificity (Qs). Basement membrane thickness added manually. Sagittal and elevation maps of the frontcornea and elevation map of the posterior corneal surface was analyzed using color coded map. Volume of the corneaand the size and height of theanterior chamber were studied at the central 10 mm.

Results

This study includes 94 eyes of47 patient from Al_Diwaniya city; all examined by Pentacamtopographic system diagnosed with keratoconusbilaterally, the most common pattern was asymmetric bowtie with angulation followed by asymmetric bowtie inferior steep then the round and irregular shapes respectively. The least frequent class was the inferior steep and junctional while the oval shape and symmetric bowtie were in the middle as shown in table 3-1 and figure 3-1.

Table 1-1: Frequency distribution of the study sample by topographic class

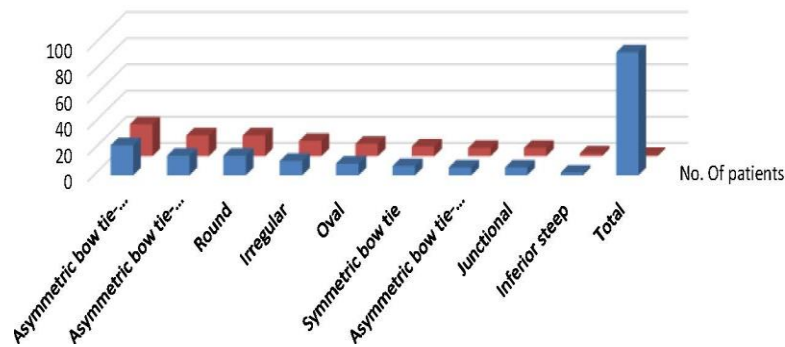| Percentage	No. Of patients	Topographical pattern
24.4	23	Asymmetric bow tie-angular
15.9	15	Asymmetric bow tie-Inferior steep
15.9	15	Round
11.7	11	Irregular
9.5	9	Oval
7.4	7	Symmetric bow tie
6.3	6	Asymmetric bow tie-superior steep
6.3	6	Junctional
2.1	2	Inferior steep
100%	94	Total

Figure 1-2: Bar chart showing the frequency of distribution of different types of topographic classes
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Discussion

Corneal surface and the pre-corneal tear film account for75 to 80 % of the refraction of the normal eye so many surgical maneuvers to correct refractive error by dealing with the corneal surface have been arise.With the evolution and widespread use of refractive surgical techniques such as astigmatic keratotomy,photorefractive keratectomy ,and phototheraputic keratectomy,the need for more presize and detailed information of the corneal surface has increasedas the quality of instrumentations has improved.The ability to obtain detailed analysis about the normal and keratoconus topography gives better understanding of corneal surface abnormality and their rules to visual function.In our study we look for the topographic patterns of keratoconus in Iraqi people to see which is the commonest pattern using the pentacam system. The asymmetric bowtie with angulation and asymmetric bowtie with inferior steep (24.4 % and 15.9%) were the most common topographic patterns followed by round and irregular (15.9% and 11.7%) respectively. In comparison with other studies like Hassan Hashemi in Tahran eye study who revealed that the so called bowtie patterns (SB/AB) was greatly dominant in the studied population. The bowtie patterns with SRAX were observed among more than 12% of studied corneas. BesidethatBogan and Coworkers (11) who testedamerican people both ametropic and emmetropic eyes by video keratography, they developed a qualitative system for typing corneal topography depends on color coded topographic maps. In their study asymmetric bowtie was the most topographic form found in (32%), followed by round (22%), oval (21%) symmetric bow tie (18%) and irregular (7%) pattern. In addition, kimetalP (12) find that in Korean people 99 eyes (42%) had asymmetric bowtie,44 eyes (19%) irregular, 42 eyes (18%) symmetric bowtie,31(13.4%) oval and 16(6.9%) round pattern so in both studies the asymmetric bowtie was the most common pattern but the angulation parameter. our study gives more interest to the pattern because its important as a risk factor for keratoconus when it is more than 30 degrees. The differences in the data may arise from variable topography system, scale, maps

Conclusions

Asymmetric Bowtie with angulation (A.B. with angulation) was the most Common topographic type, followed by Asymmetric Bowtie Inferior steep(A.B.I.S.), Round and Irregular the patterns are similar to that of other Asian people.

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